

CLAIMS

What I claim is:

1. A system for displaying aeronautical information, said system comprising:

a central processing unit;

a memory coupled to said processing unit; and

a display screen coupled to said central processing unit, said central processing unit being configured for executing the steps of:

determining whether a target aircraft is within a pre-determined monitoring zone; and

responsive, at least in part, to said target aircraft being within said pre-determined monitoring zone, displaying a closure indicator on said display screen.

2. The system of Claim 1, wherein said central processing unit is configured for executing the step of:

responsive, at least in part, to said target aircraft being outside of said pre-determined monitoring zone, displaying no closure indicator on said display screen.

3. The system of Claim 1, wherein said central processing unit is configured for allowing a user to modify at least one boundary of said pre-determined monitoring zone.

4. The system of Claim 1, wherein said predetermined monitoring zone is adjacent a front portion of an Own Ship aircraft.

5. The system of Claim 4, wherein said monitoring zone is a substantially cone-shaped segment of airspace.

6. The system of Claim 5, wherein an apex of said cone-shaped segment of airspace is positioned adjacent a front end of said Own Ship aircraft, and wherein an axis of said cone-shaped segment of airspace is substantially co-linear with a track of said Own Ship aircraft.

7. The system of Claim 5, wherein a vertex angle of said cone-shaped segment of airspace is about 40 degrees.

8. The system of Claim 1, wherein said central processing unit is configured for allowing a user to at least partially modify at least one boundary of said monitoring zone.

9. The system of Claim 1, wherein said central processing unit is configured for executing the steps of:

comparing a track of said target aircraft with a track of an Own Ship aircraft; and

responsive, at least in part, to said track of said target aircraft being within a pre-determined variation angle of said track of said Own Ship aircraft, performing said step of displaying said closure indicator on said display screen.

10. The system of Claim 9, wherein said central processing unit is configured for executing the step of:

in response to said track of said target aircraft being outside of said pre-determined variation angle of said track of said Own Ship, displaying no closure indicator on said display screen.

11. The system of Claim 9, wherein said central processing unit is configured for allowing a user to modify said predetermined variation angle.

12. The system of Claim 9, wherein said predetermined variation angle is about 20 degrees.

13. The system of Claim 9, wherein said closure indicator comprises a closing/receding indicia that indicates whether said Own Ship aircraft is closing in on, or receding from, said target aircraft.

14. The system of Claim 13, wherein said closure indicator comprises a closure rate indicator.

15. The system of Claim 14, wherein said closure rate indicator comprises an alphanumeric value indicating the current rate at which said Own Ship aircraft is closing in on, or receding from, said target aircraft.

16. The system of Claim 9, wherein said central processing unit is configured for displaying said closure indicator to one side of a symbol representing said Own Ship aircraft in response to a closure rate between said target aircraft and said Own Ship aircraft being outside of a predetermined range.

17. The system of Claim 9, wherein, if a closure rate between said target aircraft and said Own Ship aircraft is within a predetermined range, said closure indicator comprises a closing/receding indicia that indicates whether said Own Ship aircraft is closing in on, or receding from, said target aircraft.

18. The system of Claim 17, wherein, if a closure rate between said target aircraft and said Own Ship aircraft is outside of said predetermined range, said closure indicator does not comprise a closing/receding indicia that indicates whether said Own Ship aircraft is closing in on, or receding from, said target aircraft.

19. The system of Claim 17, wherein if a closure rate between said target aircraft and said Own Ship aircraft is above a predetermined upper threshold value, said closure indicator comprises a closing/receding indicia that indicates that said Own Ship aircraft is closing in on said target aircraft.

20. The system of Claim 19, wherein said predetermined upper threshold value is about 5 knots.

21. The system of Claim 17, wherein, if a closure rate between said target aircraft and said Own Ship aircraft is below a predetermined lower threshold value, said closure indicator comprises a closing/receding indicia that indicates that said Own Ship aircraft is receding from said target aircraft.

22. The system of Claim 21, wherein said predetermined lower threshold value is about -5 knots.

23. The system of Claim 17, wherein said closing/receding indicia comprises an upwardly-directed arrow if said Own Ship aircraft is closing in on said target aircraft.

24. The system of Claim 17, wherein said closing/receding indicia is displayed above a symbol representing said Own Ship aircraft if said Own Ship aircraft is closing in on said target aircraft.

25. The system of Claim 17, wherein said closing/receding indicia comprises a downwardly-directed arrow if said Own Ship aircraft is receding from said target aircraft.

26. The system of Claim 17, wherein said closing/receding indicia is displayed below a symbol representing said Own Ship aircraft if said Own Ship aircraft is receding from said target aircraft.

27. The system of Claim 9, wherein said central processing unit is configured for executing the steps of:

determining whether a closure rate between said target aircraft and said Own Ship aircraft is above a predetermined upper threshold value; and

responsive, at least in part, to said closure rate being above said predetermined upper threshold value, displaying said closure indicator in a predetermined position on said display screen.

28. The system of Claim 27, wherein said predetermined position is immediately above an Own Ship icon displayed on said display screen.

29. The system of Claim 9, wherein said central processing unit is configured for executing the steps of:

determining whether a closure rate between said target aircraft and said Own Ship aircraft is above a predetermined upper threshold value; and

responsive, at least in part, to said closure rate being above said predetermined upper threshold value, displaying a closing/receding indicia on said display screen.

30. The system of Claim 29, wherein said predetermined upper threshold value is about 5 knots.

31. The system of Claim 9, wherein said central processing unit is configured for executing the steps of:

determining whether a closure rate between said target aircraft and said Own Ship aircraft is below a predetermined lower threshold value;
and

responsive, at least in part, to said closure rate being below said predetermined lower threshold value, displaying said closure indicator in a predetermined position on said display screen.

32. The system of Claim 31, wherein said predetermined position is immediately below an Own Ship icon displayed on said display screen.

33. The system of Claim 9, wherein said central processing unit is configured for executing the steps of:

determining whether a closure rate between said target aircraft and said Own Ship aircraft is below a predetermined lower threshold value;
and

responsive, at least in part, to said closure rate being below said predetermined lower threshold value, displaying a closing/receding indicia on said display screen.

34. The system of Claim 33, wherein said lower threshold value is about -5 knots.

35. The system of Claim 1, wherein said central processing unit is configured for executing the step of:

in response to (1) a closure rate between said target aircraft and said Own Ship aircraft being above a predetermined lower threshold value; and (2) said closure rate being below a predetermined upper threshold value, executing a step of displaying no closure indicator on said display screen.

36. The system of Claim 1, wherein said central processing unit is configured for executing the step of:

in response to (1) a closure rate between said target aircraft and said Own Ship aircraft being above a predetermined lower threshold value; and (2) said closure rate being below a predetermined upper threshold value, executing a step of displaying no closing/receding indicia on said display screen.

37. The system of Claim 36, wherein said central processing unit is configured for allowing a user to modify said predetermined upper threshold value.

38. The system of Claim 36, wherein said central processing unit is configured for allowing a user to modify said predetermined lower threshold value.

39. The system of Claim 1, wherein said central processing unit is configured for removing said closure indicator from said display screen in response to said Own Ship aircraft landing.

40. The system of Claim 1, wherein said central processing unit is configured for removing said closure indicator from said display screen in response to said target aircraft landing.

41. A computer-readable medium comprising computer-executable instructions for performing the steps of:

comparing a track of a target aircraft with a track of an Own Ship aircraft;
and

responsive, at least in part, to said track of said target aircraft being within a pre-determined variation angle of said track of said Own Ship aircraft, displaying a closure indicator on said display screen.

42. The computer-readable medium of Claim 41, wherein said computer-readable medium further comprises computer-executable instructions for:

determining whether said target aircraft is within a pre-determined monitoring zone; and

responsive, at least in part, to said target aircraft being within said pre-determined monitoring zone, performing said step of displaying a closure indicator on said display screen.

43. The system of Claim 41, wherein said computer-readable medium further comprises computer-executable instructions for:

in response to (1) a closure rate between said target aircraft and said Own Ship aircraft being above a predetermined lower threshold value; and (2) said closure rate being below a predetermined upper threshold value, executing a step of displaying no closing/receding indicia on said display screen.

44. A method of displaying aeronautical information, said method comprising the steps of:

determining whether a closure rate between a target aircraft and an Own Ship aircraft is above a predetermined upper threshold value; and

responsive, at least in part, to said closure rate being above said predetermined upper threshold value, performing a step of displaying a closure indicator on a display screen, said closure indicator comprising a closing/receding indicia.

45. The method of Claim 44, said method further comprising the steps of :

determining whether said closure rate is below a predetermined lower threshold value; and

responsive, at least in part, to said closure rate being below said predetermined lower threshold value, performing a step of displaying a closure indicator on a display screen, said closure indicator comprising a closing/receding indicia.

46. The method of Claim 45, said method further comprising the steps of:

in response to (1) a closure rate between said target aircraft and said Own Ship aircraft being above a predetermined lower threshold value; and (2) said closure rate being below said predetermined upper threshold value, executing a step of displaying a closure indicator on a display screen, said closure indicator comprising no closing/receding indicia.

47. The method of Claim 45, said method further comprising the steps of:

determining whether said target aircraft is within a pre-determined monitoring zone; and

responsive, at least in part, to said target aircraft being within said pre-determined monitoring zone, displaying a closure indicator on said display screen.

48. The method of Claim 47, said method further comprising the steps of:

comparing a track of said target aircraft with a track of said Own Ship aircraft; and

responsive, at least in part, to said track of said target aircraft being within a pre-determined variation angle of said track of said Own Ship aircraft, displaying a closure indicator on said display screen.

49. The method of Claim 45, said method further comprising the steps of:

comparing a track of said target aircraft with a track of said Own Ship aircraft; and

responsive, at least in part, to said track of said target aircraft being within a pre-determined variation angle of said track of said Own Ship aircraft, displaying a closure indicator on said display screen.

50. A system for displaying aeronautical information, said system being configured for use within an Own Ship aircraft, and said system comprising:

a central processing unit;

a memory coupled to said processing unit; and

a display screen coupled to said central processing unit, said central processing unit being configured for executing the steps of:

determining a closure rate between a target aircraft and said Own Ship aircraft;

displaying a symbol representing said Own Ship aircraft on said display screen; and

displaying a closure indicator on said display screen adjacent to said symbol representing said Own Ship aircraft, said closure indicator being operative to visually relate said closure rate to a user.

51. The system of Claim 50, wherein said closure indicator comprises a closing/receding indicia that indicates whether said Own Ship is closing in on, or receding from, said target aircraft.

52. The system of Claim 51, wherein said closing/receding indicia comprises an upwardly-directed arrow if said Own Ship aircraft is closing in on said target aircraft, and a downwardly-directed arrow if said Own Ship aircraft is receding from said target aircraft.

53. The system of Claim 51, wherein said closure indicator comprises a closure rate indicator that includes an alphanumeric value indicating the current rate at which said Own Ship aircraft is closing in on, or receding from, said target aircraft.

FIG. 10 is a block diagram of a system for determining a closure rate indicator.